Space Weather Forecast

Issued on Wednesday 29 January 2025 at 01:34 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated M-class flares. Chance of G1 minor geomagnetic storms from day 3 (31 Jan).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been at moderate levels, with one moderate class flare at 28/1945UTC from the northeast of the disc.

There are currently seven sunspot regions visible on the Earth-facing side of the Sun, many of which are located near the limbs, making detailed analysis challenging. Three regions are expected to rotate beyond the western limb in the coming days. Meanwhile, two regions are emerging from the eastern limb. One of these regions appears to exhibit some magnetic complexity, warranting further analysis as it moves across the solar disc. The remaining sunspots are small and magnetically simple.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was at background levels, ranging from 280-360 km/s. The Interplanetary Magnetic Field was mostly weak, but peaked briefly at moderate levels. The north-south component varied weakly. Geomagnetic activity was mostly Quiet to Unsettled (Kp0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected with a chance of further isolated M-class flares, and a slight chance of X-class flares, mainly from the active region in the northeast

Solar Wind / Geomagnetic Activity: A CME associated with a filament eruption around midnight on 26 Jan may give a weak glancing blow early on Day 1 (29 Jan), albeit this is low confidence with most of the CME expected to miss Earth. A large coronal hole, currently in the eastern hemisphere, may cause an enhancement to solar winds from Day 3 (31 Jan).

Quiet to Unsettled activity (Kp0-3) is generally expected through the forecast period, with a very slight chance of Active to G1/Minor Storm (Kp4-5) intervals early Day 1 (29 Jan) should any glancing

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CMEs arrive. An increasing risk of Active, or possibly G1 minor storm, intervals then possible on Days 3 and 4 (31 Jan-01Feb) with any connection to CH11/+ high speed stream.

Energetic Particles / Solar Radiation: There is a slight chance of enhancements exceeding the S1/Minor Radiation Storm threshold at first, should any larger flares occur from over the western limb.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	15	10	30	30
Strong	**G3**	No	1	1	5	5
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	No	50	50	50	50
Very Active	**R3-R5 (X Class)**	No	5	5	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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